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In 2 parts

# Connecting The Amdek Amdisk III To The Zebra FDD 3000

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These are my notes on how you can connect the Amdek Amdisk III unit to your Zebra unit(s) so that you can use the additional 2 disk drives that the Amdek unit has to offer.

This modification was originally made by Tommy from Zebra Systems, and is no longer associated with Zebra now. It was done to an FDD 3000 unit and can be easily adapted for use on the older "grey box" system with little difficulty. I have 2 FDD 3000 & 2 Amdek units and have modified the second disk system myself.

If you do not feel capable of making these changes yourself, by all means, find a technician who can. This article is meant for those brave & capable souls who have the ability to do it themselves.

The advantages of this setup are quite obvious. You have 4 disk drives on-line in one system offering you 560k of storage capacity. This is most useful in the CP/M mode. Another plus is the 2 extra disk drives are the same type of disk format. This eliminates the need for multiple copies on different disk formats. The disadvantages are small, but should be noted and taken into account. The Amdek units are sensitive to voltage variations on the mains power line. Once my unit was connected to the same pair of outlets that my refrigerator was connected to and, while reading a disk in the Amdek unit, the refrigerator "kicked in" and I lost the whole disk (I theorize it was reading the directory tracks when this unfortunate event took place). Also, some times a disk written on the Amdek unit can't be read on the FDD 3000 unit and vice versa. This might be caused by head alignment to be somewhat off between the two units and when temperature and humidity vary. This is easily solved by either placing the problematic disk in the other unit or another drive within that unit - in other words - try the other 3 (or 2) drives before abandoning all hope.

The Amdek units that I have were bought from Peripherals Direct, Ltd. located in Northbrook, Illinois. These units were selling for as low as $30 before they were sold out.

These units take the 3" type disk, known as the CF2. The Amdek unit consists of the following:

(1) Two 3" disk drives mounted vertically housed in attractive beige and grey enclosure
(2) Heavy-duty power supply
(3) Muffin fan
(4) 37-pin "D"-type connector.

It should be noted that you cannot substitute one unit's disk drive in the other; this will not work, for I have tried it. It should also be noted that the Amdek drives can determine which side of the disk has been inserted. The LED is green for side "A" or "1" and is red when side "B" or "2" is inserted.

In this modification, I have made my Amdek unit disk drives "A" and "B", and have made the FDD 3000 unit disk drives "C" and "D". My preference for this was simple: one that the disk drive used most often was drive "A" was now vertically mounted for longer life (supposedly makes a difference), and another reason was that the disks would stay cool no matter how long they were left in the unit because the fan would be blowing constantly. I ran a BBS at the time and the second reason was important to me.

### Tools needed for the modifications

| | |
|---|---|
| (1) IC (Integrated Ckt) Puller | (Radio Shack part # 276-1581) |
| (2) Phillips Screwdriver | |
| (3) Long-nose Pliers | (Radio Shack part # 64-1844) |
| (4) Diagonal Cutters | (Radio Shack part # 64-1845) |
| (5) Wire Stripper | (Radio Shack part # 64-1952) |
| (6) 40-Watt Pencil Iron | (Radio Shack part # 64-2071) |
| (7) One-Sided Razor Blade-OPTIONAL | |
| (8) Mini Screwdriver Set -OPTIONAL | (Radio Shack part # 64-1982) |

### Parts needed for the modifications

(1) 1.5 feet of 34 Conductor Ribbon Cable: You may buy this through Computer Shopper magazine or make this from Radio Shack 36 Connector ribbon cable part # 278-774. To do this, first measure off 1.5 feet & cut off remainder with the diagonal cutters. Try to make this a straight-across cut through the ribbon cable. Second, use one-sided razor blade to slice off 2 of the 36 cables. This gives you the 1.5 feet of 34 ribbon cable at this point.

(2) 34-Position Female Header Connector (Radio Shack part # 276-1525)

(3) 34-Position Male Header Connector: Not sold by Radio Shack. Check Computer Shopper or electronics parts store.

(4) 37-Position "D-type" Male Flat Ribbon Connector: This is used to mate onto the 37-position "D-type" Female Connector at the rear of the Amdek unit. Make sure that you get the flat ribbon, non-soldering, connector type. Not sold by Radio Shack. Check Computer Shopper Magazine or an electronics parts store.

(5) Rosin Core Solder (Radio Shack part # 64-001)

(6) Dielectric (Electrical) Tape (Radio Shack part # 64-2348)

### Modifications to the Zebra FDD 3000 unit

(1) Turn FDD 3000 unit upside down. Remove the 2 outer black screws from each side. Right the unit by turning the upside up (back to normal). Slide off top of unit either towards you or away from you. The interior of the unit is now revealed to you.

(2) Remove the card-edge connector from disk "A" by simply pulling it off the card-edge with your hands. You do not have much ribbon to "play with". Remove the card-edge connector from the ribbon cable and place it back on the ribbon cable about 1 inch lower. This is a time consuming part if done manually. You now have room at the end of the calbe to add the 34-position male header connector. You may find the mini screwdriver set handy here with opening up the card edge connector.

(3) Have the rear of the FDD 300 facing you. Add the 34 position male header connector to the end of the conductor ribbon cable. Install the 34 position male header connector facing the rear of the unit with the slotted side down. The slots are on the inside of the 34 position male header connector. The other side of the inside of the connector is smooth. The slot allows the female cable to mate with it in only one position; you will not be able to mate the female connector if you turn the female upside down.

(4) Insert your ribbon cable through the top one of the two air vents in the rear of the unit. Half of your 1.5 feet 34 connector ribbon cable is inside the unit and half should be outside.

(5) Place the 34 position female header connector at the end of the inside portion of your 1.5 feet of ribbon cable. It should be facing down with the slotted side facing the rear of the unit and also the 1.5 feet of ribbon cable.

(6) Insert the 34 position female header connector into the 34 position male header connector.

(7) Remove the blue IC (integrated circuit) with the IC puller. This blue IC is only on disk drive "A" of the FDD 3000 nit. You should place the IC into a piece of styrofoam and save it in case your Amdek unit ever needs servicing so that you can always reinstalll the blue IC. This is a pull-up resistor IC (labeled R1 on the circuit board).

(8) If you have your Zebra Floppy Disk Drive System for the Timex 2068 Computer Users Manual, open it up to page 6 and at the top of the page, you will see "2.3 Expanding the System" and a diagram at the bottom of the page. Study this diagram carefully. On disk drive "A" circuit board, locate the jumper labeled J01. With the rear of the unit facing you, it is located directed above the resistor labelled R4. Remove the programing jumper from position 0 of the jumper with the long-nosed pliers and replace it onto position 2 of the jumper. You have now changed disk drive "A" to "C".

NOTE: If you have the old silver boxes and only one disk drive, you are now finished with all the modifications to the Zebra Side. Close up your old silver disk drive "A" and go on to step number 11 in this section. However, if you have the old silver system and two disk drives, close up disk drive "A" and open up disk drive "B" now.

(9) On disk drive "B", remove the programming jumper from position 1 with the long-nosed pliers and replace it onto position 3 of the jumper. You have now changed disk drive "B" to "D".

(10) Replace the top cover of the unit by sliding it back over

the unit. Turn it upside down and replace the black screws and fasten them.

(11) Have the rear of the FDD 3000 unit facing you with the 34 conductor ribbon cable extending towards you. Take and place the 37 position "D type" Male Flat Ribbon Connector facing down with the wide side towards you and the narrower side towards the FDD 3000 unit. Place the 37 position "D Type" Male Flat Ribbon Connector right justified on the 34 conductor ribbon cable as possible so that positions 1, 2, & 20 have no ribbon to connect to. This is one of the 5 critical connections that are important you get correct. The other 4 are the swapping of the wires in the Amdisk unit. Ensure that when the ribbon cable is extended horizontally from the rear of the FDD 3000 unit that the 37 Position "D type" Male Flat Ribbon Connector faces down and that the left 3 positions on the 37 position "D type" Male Flat Ribbon Connector (positions 1, 2, & 20) have no ribbon cable leading to them.

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Part 2 of 2

## Connecting an Amdek Amdisk III unit to the Zebra Disk Unit
(Part 2 of 2)

Modifications to the Amdek Amdisk III unit

(1) Remove the 5 black screw (2 on each side near the bottom of the unit and 1 in the rear at the bottom near the 37 position "D Type" Female connector) with a Phillips screwdriver and remove the grey cover by prying open both sides of the grey cover from the bottom with your hands and sliding the grey cover backwards.

(2) You will see 2 sets of DIP switches on each disk drive. The first one on top is labelled DSW1 and has 5 switches. This is the unit's programming jumpers. Switch 1 should always be off. Only 1 of the 5 switches should be ON at a time. Switch 2 ON selects the drive as "A", Switch 3 selects the drive as "B", switch 4 selects the drive as "C", and switch 5 selects the drive as "D". The second DIP is immediately beneath the first and is labelled DSW2. DSW2 contains 7 switches. These are the pull-up resistors. Look at the DIP settings for disk 1 on the unit. This is rather difficult and might produce some eyestrain. Don't worry about that because the factory settings are correct for this disk drive. DIP DSW1 should have switch 3 ON only and on DSW2 all switches should be OFF. If not, make these corrections.

(3) On disk 0 of the unit, you must change DIP DSW1 from its factory setting. Move switch 3 to OFF and switch 2 to ON. Disk drive 0 will become drive "A" and disk drive 1 will become "B" on your expanded system.

(4) Remove the card edge connector from disk drive 0 of the unit with your hands.

(5) You must clip 4 wires leading from card edge connector 0 to card edge connector. They should be cut at about 1.75 inches from the card edge connector "0" with the diagonal cutters. These wires are annotated in the diagram below with either 1 or 2 asterisks. They are: 10-Blue, 12-Yellow, 14-Red, & 16-Black.

```
            Top
T   1-Brown  ===  1-Brown       T
o   2-Red    ===  2-Red         o
    3-Orange ===  3-Orange
C   4-Yellow ===  4-Yellow      C
a   5-Green  ===  5-Green       a
r   6-Blue   ===  6-Blue        r
d   7-Violet ===  7-Violet      d
-   8-Grey   ===  8-Grey        -
e   9-White  ===  9-White       e
d  10-Blue   === 10-Blue     ** d
g  11-Green  === 11-Green       g
e  12-Yellow === 12-Yellow   *  e
   13-Orange === 13-Orange
C  14-Red    === 14-Red      *  C
o  15-Brown  === 15-Brown       o
```

```
n 16-Black  === 16-Black   ** n
n 17-Violet === 17-Violet     n
e 18-Grey   === 18-Grey       e
c 19-White  === 19-White      c
t 20-Black  === 20-Black      t
o 21-Brown  === 21-Brown      o
r 22-Red    === 22-Red        r
  23-Orange === 23-Orange
0 24-Yellow === 24-Yellow     1
  25-Green  === 25-Green
  26-Blue   === 26-Blue
  27-Violet === 27-Violet
  28-Grey   === 28-Grey
  29-White  === 29-White
  30-Black  === 30-Black
  31-Brown  === 31-Brown
  32-Red    === 32-Red
  33-Orange === 33-Orange
  34-Red    === 34-Red
          Bottom
```

(6) Carefully strip off .25 of an inch of insulation from these 4 cut wires so as not to cut off any more of the wires themselves.

(7) Connect the 10-Blue wire connected to card edge connector 0 to 16 Black coming from the card edge connector 1. Solder these wires using the rosin core solder and the 40 Watt pencil iron. When the solder cools down, place a small strip of dielectric tape over the soldered connection so as to insulate it.

(8) Connect the 16-Black wire connected to card-edge connector 0 to 10-Blue coming from the card edge connector 1. Solder these wires using the rosin core solder and the 40 Watt pencil iron. When the solder cools down, place a small strip of dielectric tape over the soldered connection so as to insulate it.

(9) Connect the 12-Yellow wire connected to card edge connector 0 to 14-Red coming from the card edge connector 1. Solder these wires using the rosin core solder and the 40 Watt pencil iron. When the solder cools down, place a small strip of dielectric tape over the soldered connection so as to insulate it.

(10) Connect the 14-Red wire connected to card edge connector 0 to 12-Yellow coming from the card edge connector 1. Solder these wires using the rosin core solder and the 40 Watt pencil iron. When the solder cools down, place a small strip of dielectric tape over the soldered connection so as to insulate it.

(11) Visually check to ensure the connections that you have now are the same as the diagram illustrated below:

```
            Top
T  1-Brown  ===  1-Brown      T
o  2-Red    ===  2-Red        o
   3-Orange ===  3-Orange
```

```
C  4-Yellow ===  4-Yellow    C
a  5-Green  ===  5-Green     a
r  6-Blue   ===  6-Blue      r
d  7-Violet ===  7-Violet    d
-  8-Grey   ===  8-Grey      -
e  9-White  ===  9-White     e
d 10-Blue   *** 16-Black  ** d
g 11-Green  === 11-Green     g
e 12-Yellow *** 14-Red    *  e
  13-Orange === 13-Orange
C 14-Red    *** 12-Yellow *  C
o 15-Brown  === 15-Brown     o
n 16-Black  *** 10-Blue   ** n
n 17-Violet === 17-Violet    n
e 18-Grey   === 18-Grey      e
c 19-White  === 19-White     c
t 20-Black  === 20-Black     t
o 21-Brown  === 21-Brown     o
r 22-Red    === 22-Red       r
  23-Orange === 23-Orange
0 24-Yellow === 24-Yellow    1
  25-Green  === 25-Green
  26-Blue   === 26-Blue
  27-Violet === 27-Violet
  28-Grey   === 28-Grey
  29-White  === 29-White
  30-Black  === 30-Black
  31-Brown  === 31-Brown
  32-Red    === 32-Red
  33-Orange === 33-Orange
  34-Red    === 34-Red
           Bottom
** soldered connection
```

(12) Replace the card edge connector to disk drive 0 of the unit with your hands.

(13) Replace the grey cover and slide it over the beige front somewhat so that it "locks" in. Replace and fasten the 5 black screws with the Phillips screwdriver.

## Operating the Expanded System

(1) Ensure that all devices are plugged in to the electrical outlet and are in the "OFF" position. Place the FDD 3000 unit facing you and place the Amdek unit facing you on the left side of the FDD 3000 unit. Connect the 37 position "D type" Male Flat Ribbon Connector extending from the FDD 3000 unit onto the Amdek 37 position Female Connector (located at the rear of the Amdek unit). Ensure that your FDD 3000 unit is hooked up to your silver expansion box sitting on the "T dock" connector connected to your Timex Sinclair 2068. Your computer should be in the "OFF" position. (2) Push the button located in the top right side of the Amdek unit to the "ON" position.

(3) Power up the FDD 3000 unit from the rear and the "power

on" LED should light up red indicating power to the unit. Both LEDs on the Amdek unit should light up green.

(4) Insert a formatted disk into disk drive 0 of the Amdek unit. You will hear the familiar whirring of the disk indicating that the operating system has been read.

(5) Ensure that your monitor or television display is ON. Now you can turn on your computer. Everything now is the same as before when you had the unexpanded system.

## Expanded System Notes

(1) This modification is for the Amdek unit that is IBM compatible, not for the Amdek B units that are Shugart compatible.

(2) When a disk is inserted into the Amdek unit, the LED will remain green if side "A" of the disk is inserted or will change to red if side "B" of the disk is inserted.

(3) The Amdek disk drive 0 is drive "A" and disk drive 1 is drive "B", the FDD 3000 disk drive A is now drive "C" and disk drive B is now drive "D" in the expanded system. This is for both the T.O.S. operating system & under CP/M. This also works for the Spectrun mode if your silver interface box is modified for it and have a Spectrum T.O.S. disk. Happy computing!

(4) The LEDs on the Amdek unit will not light up properly when a disk drive is selected. This is the only minor inconvenience that you must tolerate.